

WHAT IS CLAIMED IS:

1. A door suspension system comprising:
  - at least one rail support adapted to be attached to a door frame above a doorway
  - 5 opening;
  - an elongated rail mounted on said at least one rail support;
  - at least two brackets each having a connector attached to a respective support
  - block, each said support block having an opening formed therein
  - receiving at least a portion of said rail;
  - 10 a support piece attached to said connectors and provided with connection means
  - adapted to be attached to a door for suspending the door in the doorway
  - opening; and
  - an elongated magnetic way attached to one of said at least one rail support and
  - said support piece and a primary of a linear motor attached another one of
  - 15 said at least one rail support and said support piece, said magnetic way
  - and said primary being positioned to generate an attraction force
  - therebetween whereby when a door is attached to and suspended by said
  - connection means, said attraction force cancels at least partially a weight
  - of the door.
  - 20
2. The door suspension system according to claim 1 wherein said at least one
- rail support includes an elongated rigid plate to which said rail and said magnetic way are
- attached, wherein each said connector has a substantially C-profile embracing said rail
- and said rigid plate, said rigid plate being formed of a ferromagnetic material and being
- 25 substantially flat shaped with a horizontally disposed planar surface, and wherein said
- primary is mounted on said planar surface of said support piece.
3. The door suspension system according to claim 1 wherein said at least one
- rail support includes an elongated rigid plate to which said rail and said primary are
- 30 attached, said rigid plate being formed of a ferromagnetic material and being
- substantially flat shaped with a horizontally disposed planar surface, wherein each said

connector has a substantially C-profile embracing said rail and said primary, and wherein said magnetic way is mounted on said planar surface of said support piece.

4. The door suspension system according to claim 1 wherein each said bracket  
5 includes a bearing of substantially cylindrical shape with an axial hole formed therein, each said bearing being mounted in said opening of said support block and wherein said rail is received in said hole.

5. The door suspension system according to claim 1 wherein said at least one  
10 rail support includes a plate spaced above said support piece, said magnetic way is mounted on a lower surface of said plate and said primary is mounted on an upper surface of said support piece in a space between said brackets.

6. The door suspension system according to claim 1 wherein said at least one  
15 rail support includes a plate spaced above said support piece, said magnetic way is mounted on an upper surface of said support piece and said primary is mounted on a lower surface of said plate.

7. The door suspension system according to claim 1 wherein said rail has a  
20 substantially cylindrical head body attached to an upper end of a web with extensions at a lower end thereof attached to said at least one rail support.

8. The door suspension system according to claim 7 wherein each said bracket  
includes a bearing of substantially cylindrical shape with an axial hole formed therein  
25 and a longitudinal opening extending from said axial hole, each said bearing being mounted in said opening of said support block, and wherein said head body of said rail is received in said axial hole and said web of said rail is received in said opening.

9. The door suspension system according to claim 1 wherein said at least one  
30 rail support includes a plate provided with recesses mounting magnets forming said magnetic way.

10. The door suspension system according to claim 1 wherein said magnetic way includes one of neodymium rare earth permanent magnets and ferrite permanent magnets.

5        11. An elevator door suspension system comprising:  
at least one rail support adapted to be attached to a door frame above an elevator  
doorway opening;  
an elongated rail mounted on said at least one rail support;  
at least two brackets each having a connector attached to a respective support  
10        block, each said support block having an opening formed therein  
receiving at least a portion of said rail;  
an elevator door;  
a support piece attached to said connectors and provided with connection means  
attached to said door for suspending said door in the doorway opening;  
15        and  
an elongated magnetic way attached to one of said at least one rail support and  
said support piece and a primary of a linear motor attached another one of  
said at least one rail support and said support piece, said magnetic way  
and said primary being positioned to generate an attraction force  
20        therebetween canceling at least partially a weight of said door.

12. A door suspension system comprising:  
a rail support adapted to be attached to a door frame above a doorway opening  
and having a plate;  
25        an elongated rail mounted on an upper surface of said plate;  
a pair of brackets each having a connector attached to a respective support block,  
each said support block having an opening formed therein receiving at  
least a portion of said rail;  
a door;  
30        a support piece attached to said connectors and provided with connection means  
attached to said door for suspending said door in the doorway opening;  
and

an elongated magnetic way attached to one of a lower surface of said plate and an upper surface of said support piece and a primary of a linear motor attached another one of said plate lower surface and said support piece upper surface, said magnetic way and said primary being positioned to generate an attraction force therebetween canceling at least partially a weight of said door.

10